Remarks

Reconsideration of the rejections stated in the Final Office Action dated May 6, 2008 is requested in view of the following comments and the attached declaration.

Introduction

All the rejections rely on Buntin et al., U.S. Patent No. 3,849,241 ("Buntin"), in combination with various other references. The following comments and an attached declaration under PTO Rule 132, by showing the insufficiency of Buntin as a prior-art reference against applicants' claimed invention, are submitted to demonstrate that all the rejections should be withdrawn.

I. Applicants' invention solved a real problem, and achieves an unexpected result

A. The dimensional instability of PET meltblown webs is a well-documented problem

Bhat et al., U.S. Patent No. 5,753,736, issued May 19, 1998 (Bhat), notes that despite the superior physical properties of PET fibers, PET

> exhibits poor dimensional stability at temperatures above the glass transition (70° – 80°C.). PET fibers, and the products made from the fibers ... may shrink up to 40% of the original length when subjected to these high temperatures. This shrinkage is due to the tendency of oriented amorphous molecules to relax on exposure to heat.

(Bhat, column 1, lines 10-20).

Bhat is just one example of the recognized problem of PET instability, and the problem is further discussed in applicants' specification. Beginning with the last paragraph on page 1 of applicants' specification and continuing through the first two paragraphs on page 2, the discussion is quite detailed and analyzes the technical basis for the problem. These are factual statements that have not been answered by any factual statements cited by the PTO.

Incidentally, the shrunken sample of a PET meltblown web left with the examiner at the interview of January 9, 2008 was offered simply to illustrate the problem, not as a proof of the problem. The problem is well documented apart from the sample, as discussed above.

B. Buntin does not solve the problem of meltblown PET instability

Buntin does not address or in any way suggest a solution to the problem of dimensional instability of meltblown PET fibrous webs. Bhat, discussed above, was filed and issued long after the Buntin patent issued. It is clear from Bhat and the other

patents cited in applicants' specification that Buntin had not provided a solution to the problem of dimensional instability exhibited by meltblown PET fibers, to which the present invention is directed.

In fact, the attached declaration of David A. Olson, an expert in the field of meltblowing and a named inventor of the present application, states that, in addressing the problem of dimensional instability of meltblown PET webs, a person skilled in the art of meltblowing would not turn to Buntin to solve the problem and, to the contrary, would seek to avoid the polymer degradation that Buntin seeks (Olson declaration, Section 9; see also, Section III below)

C. Applicants' invention is an unexpected result

As discussed above and in applicants' specification, many prior workers have tried to prepare a dimensionally stable meltblown PET web, but without success. Applicants have achieved that result, as illustrated in the working examples of their patent application. Applicants' achievement of dimensional stability is an unexpected result, and is evidence of patentability.

II. Applicants' invention involves method steps not taught in Buntin

A. Applicants' narrow temperature ranges, which achieve an unexpected result, are unknown to Buntin

1. Applicants teach narrow temperature ranges that are not taught by Buntin

The contrast between Buntin's teaching on temperature ranges (setting aside the absence of any meaningful teaching in Buntin relating these temperature ranges to PET) and applicants' temperature ranges is summarized in the following table.

	Buntin's temperature ranges	Applicants' temperature ranges
Extruded polymer temperature	288°C to 482°C (550°F to 900°F)	295°C or less and preferably 285°C or less
Air temperature	260°C to 482°C (500°F to 900°F)	270°C or less and preferably 260°C or less

As the table shows, applicants' "extruded polymer temperature" range is in a low-temperature regime, lower than Buntin's range, except for a minor overlap with Buntin's range (7 °C). And applicants' "air temperature" range is also lower than Buntin's range except for a minor overlap with Buntin's range (about 10 °C). Applicants' preferred "extruded polymer temperature" range has no overlap with

Buntin's range and applicants' preferred "air temperature" range is at the border of Buntin's range.

Despite their minor overlap, applicants' temperature ranges are novel over Buntin. Applicants' extruded temperature range of 295°C or less and preferably 285°C or less is different from Buntin's range of 288°C to 482°C.

And applicants' method, callng for the recited temperature ranges, achieves a new and unique result not taught by Buntin. Applicants' temperature ranges are novel in their specific temperature boundaries, in their purpose, and in their results.

2. Applicants' distinctive temperature ranges achieve a unique result not taught by Buntin

As discussed above, applicants have found a way to achieve dimensionally stable meltblown PET fibrous webs through their claimed method steps, with their novel temperature ranges. It is indisputable that Buntin does not teach that dimensionally stable meltblown PET fibrous webs will be obtained by practicing applicants' claimed method within applicants' stated temperature range. Applicants' invention is unknown to Buntin.

3. Buntin does not meet the "sufficient specificity" test of MPEP 2131.03

MPEP 2131.03 states

> If the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range, depending on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims.

Here, where applicants' temperature ranges are in a low-temperature regime having at most a minor overlap with Buntin's ranges, and a major unexpected result is achieved by applicants' distinctive ranges, it is clear that applicants' claims are not anticipated by Buntin.

B. Applicants' claim-recitation "sufficient to impart chain-extended crystallization to the PET fibers" further distinguishes applicants' claimed subject matter from Buntin's teachings

The quoted claim-recitation further characterizes applicants' claimed method, because it calls for the method to be performed to produce a specific measurable result, "chain-extended crystallization," which Buntin does not teach. A reader of Buntin is not guided by the need to control his degradation process to impart chain-extended crystallization. No prior-art reference suggests that aiming for degradation will bring a

worker to crystallization. Instead, as the attached Olson declaration states, a person skilled in the art of meltblowing would avoid Buntin's process intended to produce polymer degradation when faced with the problem of poor strength and dimensional stability in meltblown PET webs (Olson declaration, Section 9).

III. Buntin's process guidelines bar Buntin from teaching applicants' invention in PET webs

A. Buntin requires degradation to a viscosity that excludes PET

Buntin teaches that a thermal treatment according to his invention is "adequate" when the apparent viscosity of the treated resin is from about 50 to 300 poise; see Buntin in the paragraph bridging columns 9 and 10 (or 50 to 500 poise at column 4, lines 31-42). In the paragraph bridging columns 9 and 10, Buntin states:

> When the resin is correctly thermally treated in the extruder, the resin pressure lies in a small range independent of the melt flow rate or intrinsic viscosity of the starting resin or the nozzle die temperature. ... [B]y calculating the apparent viscosity of the degraded resin in the nozzle die holes 6 according to methods well known in polymer rheology [citations to texts], thermal treatment produces an apparent viscosity in the nozzle die holes 6 of from about 50 to about 300 poise.

Buntin's teachings about apparent viscosity make sense as to polypropylene, the only polymer as to which Buntin might be thought to make a complete teaching; but Buntin's apparent viscosity teachings do not apply to PET, the subject of applicants' invention. PET is much more viscous than polypropylene.

The viscosity of PET is described in the attached Olson declaration. Based on a large experience with meltblowing both polypropylene, the main subject of Buntin, and PET, Olson states that PET is much more viscous than polypropylene. Molten polypropylene in a meltblowing die or extruder is water-like, while molten PET in a meltblowing die or extruder is like stiff molasses (Olson declaration, Section 6).

Further, Olson reports that he determined the apparent viscosity of molten PET being extruded in the working examples of applicants' patent application, and in all cases the apparent viscosity was at least 2700 poise instead of the 300 or 500 poise taught to be a maximum by Buntin (Olson declaration, Section 7).

Olson concludes that it would not be possible to practice applicants' invention after PET was degraded to the apparent viscosity levels taught by Buntin. It would not

be possible to obtain the chain-extended crystallization called for in applicants' claims by practicing the teachings of Buntin with PET (Olson declaration, Section 8).

B. No skilled worker would, or could, follow Buntin to practice applicants' claimed process

As the Olson declaration (Section 9) points out, skilled workers would not turn to Buntin to attempt to achieve a dimensionally stable meltblown PET web, with chain-extended crystallization as called for in applicants' claims, because Buntin is about degradation, which a skilled worker would see as incompatible with obtaining chain-extended crystallization. But beyond that, the extreme degradation necessary to give PET an apparent viscosity of 500 poise or less, as called for by Buntin, would make obtaining chain-extended crystallization impossible.

IV. Buntin's teachings about PET are insufficient to teach applicants' invention

A. Buntin is not enabling as to PET

Buntin is really a patent about polyolefins, especially polypropylene. Polypropylene or other related polyolefins are discussed in every column of Buntin beginning with column 7. All the working examples in Buntin are directed to polypropylene or, in Examples 20 and 21, two related polyolefins.

Other than the one-word mention of PET in column 4, line 40, Buntin has no teaching addressed to PET. Buntin does not identify the specific temperatures to be used with PET from the broad ranges described in Buntin. As to PET, Buntin is simply an invitation to experiment, attempting to find conditions at which PET might degrade into a useful lower viscosity form suitable for meltblowing.

B. Buntin's teachings about viscosity illustrate the fatal deficiency of teachings about PET

As discussed above, Buntin teaches that a polymer is to be subjected to thermal degradation for a period of time effective to cause the requisite extent of thermal degradation (Buntin, column 3, lines 36-45). The degradation is adequate when the apparent viscosity has been reduced to 300 poise or 500 poise. But such apparent viscosities are not true for PET, which because of its fundamentally different chemical and molecular nature, has a much higher apparent viscosity than polypropylene (see the Olson declaration, Section 7). The Buntin disclosure is simply too sparse about any polymer other than polypropylene to enable a skilled worker to practice Buntin's invention with PET.

V. Summarizing, Buntin does not make the teaching the Office Action proposes in the stated rejections

The Office Action contends Buntin makes certain teachings, but as the above discussion shows, those contentions are not correct. Summarizing:

1. The Office Action contends Buntin teaches "making melt blown non-woven webs by extruding PET at a temperature of 550 F (288 ° C) or well above PET's melting point" (Office Action, page 2, 7th and 6th lines from the bottom). Besides the fact that Buntin has no enabling teaching about PET, the contention is further not correct because Buntin does not teach applicants' recited method step "extruding molten PET polymer having a temperature less than 295 degrees C or less with the sufficient specificity required by MPEP 2131.03; see Section II(A)(3) above.

2. The Office Action contends Buntin "processes [presumably PET] with a stream of air at 500 F (260 °C), which reads on the claimed range of less than about 260 °C" (Office Action, page 2, last two lines). Again, besides the fact that Buntin has no enabling teaching about PET, this contention is further not correct because Buntin does not teach applicants' recited method step "into a high-velocity stream of air ... having a manifold air temperature of about 260 °C or less" with the sufficient specificity required by MPEP 2131.03; see Section II(A)(3) above.

3. The Office Action contends "the PET of Buntin would necessarily have chain-extended crystallization imparted to provide dimensional stability to a web of the fibers principally because Buntin teaches the same process as applicant" (Office Action, page 3, first full paragraph). This contention is not correct because, among other reasons, Buntin requires degradation of any polymer taught in his patent to an apparent viscosity of 500 poise or less, and such a viscosity in PET would make chain-extended crystallization impossible; see Section III above and the attached Olson declaration, Section 8.

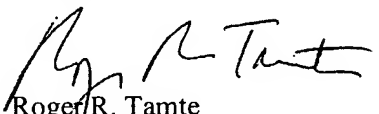
VI. Buntin's deficiencies vitiate each of the specific rejections in the Office Action

Each of the specific rejections stated in the Office Action mailed May 6, 2008 -- namely, the rejection of claims 1-3 under 35 USC 102 (b) stated on page 2, at the middle of the page; and the other rejections, all under 35 USC 103, including the rejection stated on page 4, first full paragraph; the rejection of claims 5-7 stated on page 5, first paragraph; the rejection of claims 8 and 9 on page 7, third full paragraph; the

rejection of claims 1-3 stated on page 8, second full paragraph; the rejection of claim 4 stated on page 10, third full paragraph; the rejection of claims 5-7 and 10 stated on page 11, second paragraph; and the rejection of claims 8 and 9 stated in the paragraph bridging pages 13 and 14 of the Office Action -- are traversed, because, for the reasons discussed above, each of the rejections presupposes a teaching in Buntin that is not present. See especially the discussion in Section V above.

All outstanding objections and rejections are believed to have been met and overcome. If a telephonic conference with Applicants' undersigned representative would be useful in advancing the prosecution of the present application, the Examiner is invited to contact the undersigned at (651) 733-1520. A notice of allowance for all pending claims is respectfully solicited.

Respectfully submitted,



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